UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,065	05/23/2001	Akio Kojima	50023-140	7596

7590 04/07/2004	EXAMINER	
MCDERMOTT, WILL & EMERY	HUNG, YUBIN	
600 13th Street, N.W.		
Washington, DC 20005-3096	ART UNIT	PAPER NUMBER
	2625	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.		**Applicant(s)**
Office Action Summary	09/863,065		KOJIMA ET AL.
	Examiner		**Art Unit**
	Yubin Hung		2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-31* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-31* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on *23 May 2001* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All   b) ☐ Some *   c) ☐ None of:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Examiner's comment

1.   In the Request for Corrected Filing Receipt (paper #3) recorded on September

20, 2001, it was indicated that one of the inventor's name should read **Akio Nojima**.

However, "Nojima" appears to be a typographical error. (The name appears as

"Kojima" in all other instances.)

Specification

2.   The disclosure is objected to because of the following informalities:

*   The last line of claim 6 appears out of place or extraneous

*   Claim 14, line 4: The statement is vague. Does it mean to switch "between" the

    two modes?

*   Claim 14, line 5: The statement implies that monochrome mode is always

    selected since this step is **not** indicated as optional.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552), in view of Ishikawa et al. (US 5,926,292).

5.   Regarding claim 1, and similarly claim 16, Suzuki et al. discloses:

- calculating a statistic of each data per color composing the small
  region
  [Fig. 1, numeral 32; Col. 6, lines 40-42]
- selecting one color among the above colors as a target color according
  to the statistic
  [Fig. 1, numerals 31, 33; Col. 8, lines 49-51. Note that the selected
  target color component is L*]
- dividing the small region into two sections according to a specific
  reference of the color data of the target color
  [Fig. 1, numeral 35; Col. 6, lines 50-52. Note that while the specific
  bi-level conversion process is not expressly described, simple
  thresholding is a well-known binarization approach and the threshold
  corresponds to the specific reference of the color data of the color
  data (L* in this case)]

Suzuki et al. fails to disclose the following, which Ishikawa et al. teaches:

- extracting respective representative colors for two sections
  [Fig. 11, numeral 307; Fig. 13, numerals 332-334; Fig. 14; Col. 13,
  lines 36-42; 55-61; Col. 14, lines 7-32. Note that the specific number
  of representative colors in this reference is two, one per section]

Suzuki et al. and Ishikawa et al. are combinable because they have aspects that are

from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. with the teaching of Ishikawa et al. by extracting respective

representative colors for two sections. The motivation would have been to enable

compression of the data in a block [Ishikawa et al. Col. 1, lines 63-65].

Therefore, it would have been obvious to combine Ishikawa et al. with Suzuki et al. to

obtain the invention as specified in Claim 1.

***

6.   Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552) and Ishikawa et al. (US 5,926,292) as applied to claims 1

and 16, further in view of Allebach et al. (US 5,544,284).

7.   Regarding claim 2, and similarly claim 17, Suzuki et al. and Ishikawa et al.

disclose everything except the following, which Allebach et al. teaches:

- setting the sections as the small regions if the number of sections is
  less than the specific number
  [Allebach et al.: Col. 5, lines 9-12. Note that each cell in the
  reference corresponds to a region and that repeated partitioning is
  equivalent to setting the sections as small regions (because then the
  "new" small regions can be further divided into sections)]

Allebach et al., Suzuki et al. and Ishikawa et al., are combinable because they have

aspects that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. and Ishikawa et al. with the teaching of Allebach et al. by

repeatedly partitioning if the desired number of colors is achieved. The motivation

would have been to fully utilize the capability of, say, the output device such as a

display by using its entire color palette.

Therefore, it would have been obvious to combine Ishikawa et al. and Suzuki et al. with

Allebach et al. to obtain the invention as specified in Claim 2.

***

8.   Claims 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552) and Ishikawa et al. (US 5,926,292) as applied to claims 1

and 16, further in view of Makita (US 6,269,186).

9.   Regarding claim 3, and similarly claim 18, in addition to the limitations of claim 1,

Suzuki et al. further discloses:

- the statistic is a variance
  [Fig. 8, numeral 38; Col. 10, line 5]

Suzuki et al. and Ishikawa et al. fail to disclose the following, which Makita teaches:

- the reference is an average of color data of the target color
  [Abstract. Fig. 1, numeral 104; Fig. 2, numeral S202]

Makita, Suzuki et al. and Ishikawa et al. are combinable because they have aspects that

are from the same field of endeavor of segmentation.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. and Ishikawa et al. with the teaching of Makita by using the

average color value as the threshold (i.e., the reference for dividing the region into two

sections). The motivation would have been that the average is the byproduct of

computing the variance and therefore requires no additional computing time.

Therefore, it would have been obvious to combine Makita with Suzuki et al. and

Ishikawa et al. to obtain the invention as specified in Claim 3.

***

10.   Claims 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552) and Ishikawa et al. (US 5,926,292) as applied to claims 1

and 16, further in view of Kobayashi (US 5,608,851).

Regarding claim 4, and similarly claim 19, Suzuki et al. and Ishikawa et al. disclose

everything except the following, which Kobayashi teaches:

- the representative color is an average of each color data of picture
  element included in the section
  [Fig. 1, numerals 9, 23; Col. 6, lines 43-47; Col. 7, lines 18-22]

Kobayashi, Suzuki et al. and Ishikawa et al. are combinable because they have aspects

that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. and Ishikawa et al. with the teaching of Kobayashi by using the

average of each color data as the representative color. The motivation would have

been that the average the representative value that minimizes the sum of squared

differences (i.e., in the least-square sense, which is a well-known measure of error) with

the original color values of the pixels in the block.

Therefore, it would have been obvious to combine Kobayashi with Suzuki et al. and

Ishikawa et al. to obtain the invention as specified in Claim 4.

***

11.   Claims 5, 7, 20 and 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Suzuki et al. (US 6,118,552) and Ishikawa et al. (US 5,926,292) as

applied to claims 1 and 16, further in view of Kimura et al. (US 5,487,119).

Regarding claim 5, and similarly claims 7, 20 and 22, Suzuki et al. and Ishikawa et al.

disclose everything except the following, which Kimura et al. teaches:

- detecting the color difference among each color data included in the
  small region
  [Col. 2, lines 42-61. Note that the dynamic range (line 54) corresponds
  to the color difference here]
- determining the specific number according to the color difference
  [Col. 2, lines 42-61. Note that the number of quantization indexes
  resulted from the linear quantization (lines 43-46) corresponds to the
  specific number]

Kimura et al., Suzuki et al. and Ishikawa et al. are combinable because they have

aspects that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. and Ishikawa et al. with the teaching of Kimura et al. by

determining the dynamic range of color values and then applying linear quantization

with a fixed quantization step size to determine the number of quantization indexes (i.e.,

a specific number of representative colors). The motivation would have been to reduce

the amount of data (by reducing the number of bits required to encode each value).

Therefore, it would have been obvious to combine Kimura et al. with Suzuki et al. and

Ishikawa et al. to obtain the invention as specified in Claim 5.

***

12.   Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552) and Ishikawa et al. (US 5,926,292) as applied to claims 1

and 16, further in view of Yada (US 6,285,458).

Regarding claim 6, and similarly claim21, Suzuki et al. and Ishikawa et al. disclose

everything except the following, which Yada teaches:

- extracting the number of colors included in the small region and setting
  the extracted number of colors as the specific number when the extracted
  number of colors is less than the specific number comparing each number
  of colors
  [Fig. 2, numerals 21, 22, 24, block labeled "Block Run-Length Mode;"
  Col. 8, lines 26-32. Col. 9, line 61 – Col. 10, line 16. Note that the
  specific number in this case is the smaller of thresholds th1 and th3
  and that while not expressly set, the "new" specific number is obviously
  the number of colors in the region (since they are the colors that
  represent the colors of the region)]

Yada, Suzuki et al. and Ishikawa et al. are combinable because they have aspects that

are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al. and Ishikawa et al. with the teaching of Yada by extracting the

number of colors included in the small region and setting the extracted number of colors

as the specific number when the extracted number of colors is less than the specific

number. The motivation would have been to be able to use a simple and effective

lossless compression method, namely run-length encoding, to encode the region

without losing any image quality.

Therefore, it would have been obvious to combine Yada with Suzuki et al. and Ishikawa

et al. to obtain the invention as specified in Claim 6.

***

13.   Claims 9-13, 24-28, 31 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Takaichi et al. (US 5,787,192), in view of Allebach et al. (US

5,544,284).

Regarding claim 9, and similarly claim24, Takaichi et al. discloses:

- preparing region color data, which is a pair of the color data of the
  representative colors prepared by the approximating and region
  information indicating a section including picture elements of the small
  region approximated with each representative color
  [Col. 1, lines 49-51. Note that the bit maps correspond to the region
  information. Note also that the specific number of representative
  colors for each small region is two and the storing of the colors is
  inherent.]

Takaichi et al. does not expressly disclose

- increasing the number of representative colors sequentially

However, Allebach et al. [Col. 5, lines 9-19] teaches increasing the number of code values for luminance (considered as a color in any color representation that includes the luminance component), each identifying a portioned sub-region by repeated partition, (i.e., to increase the number sequentially),

Allebach et al. and Takaichi et al. are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine Takaichi et al. with the teaching of Allebach et al. by increasing the number of representative colors sequentially through repeatedly partitioning if the desired number of colors is achieved. The motivation would have been to fully utilize the capability of, say, the output device such as a display by using its entire color palette.

Therefore, it would have been obvious to combine Allebach et al. with Takaichi et al. and Ishikawa et al. to obtain the invention as specified in Claim 9.

14.   Regarding claim 10, and similarly claim 25, Allebach et al. further teaches

- preparing a displayed image for a user from the region color data by
  selecting the number of the representative color

[Fig. 1, numerals 14-16; Col. 1, lines 29-43. Note that the number of
colors (256 in this reference) is selected according to the display's
capability]

15.   Regarding claim 11, and similarly claim 26, Takaichi et al. further teaches

- transmitting the region color data by increasing the number of the
  representative colors sequentially
  [Fig. 1A, numeral 14. Note that increasing the number of the
  representative colors sequentially is taught as per the analysis of
  claim 9]

16.   Regarding claim 12, and similarly claim 27, Takaichi et al. further teaches

- receiving the region color data by increasing the number of the
  representative color sequentially
  [Fig. 1B, numeral 24. Note that increasing the number of the
  representative colors sequentially is disclosed as per the analysis of
  claim 9]
- displaying the color image for a user by increasing the number of the
  representative color sequentially per the receiving
  [Fig. 1B, numeral 21; Col. 9, lines 11-16. Note that increasing the
  number of the representative colors sequentially is taught as per the
  analysis of claim 9]

17.   Regarding claim 13, and similarly claim 28, Allebach et al. further teaches

- setting the number of colors enough to display the image for a user
  [Fig. 1, numerals 14-16; Col. 1, lines 29-43. Note that the number of
  colors (256 in this reference) is set according to the display's
  capability]
- extracting plural representative colors from the region color data
  corresponding to the required number of colors
  [Col. 5, lines 9-19]
- deriving the color data of the displayed image according to the plural
  representative colors
  [Col. 5, lines 20-28]

18.   Regarding claim 31, it is similarly analyzed and rejected as per the analyses for

claims 9, 11 and 12. Specifically,

(the transmitting device comprising:)

- approximating means for approximating the small region with plural
  representative colors region-color-data preparing means for preparing a
  region color data combining the color data of the representative color
  prepared by the approximating and region information indicating a
  section including picture elements in the small region approximated with
  each representative color
  [Per the analysis for claim 9 (and similarly claim 24)]
- transmitting means for transmitting the region color data
  [Per the analysis for claim 11(and similarly claim 26)]

(the receiving device comprising:)
- receiving means for receiving the region color data by increasing the
  number of the representative colors sequentially and displaying means
  for displaying the color image for a user by increasing the number of
  the representative colors sequentially at the time of the receiving
  [Per the analysis for claim 12(and similarly claim 27)]

***

19.   Claims 14 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Suzuki et al. (US 6,118,552), in view of Ishikawa et al. (US 5,926,292) and

Allebach et al. (US 5,544,284).

20.   Regarding claim 14, and similarly claim 29, Suzuki et al. discloses:

- switching the color mode and the monochrome mode
  [Fig. 1, numerals 31, 33; Col. 8, lines 49-51]
- selecting a specified color data in the monochrome mode
  [Fig. 1, numerals 31, 33; Col. 8, lines 49-51. Note that the selected
  target color component is L*]
- dividing the small region into two sections according to the reference
  value of the selected color data
  [Fig. 1, numeral 35; Col. 6, lines 50-52. Note that while the specific
  bi-level conversion process is not expressly described, simple
  thresholding is a well-known binarization approach and the threshold
  corresponds to the specific reference value of the selected color data
  (L* in this case)]

Suzuki et al. fails to disclose the following, which Ishikawa et al. and Allebach et al.

teach:

- approximating a small region on a color image with specific number of representative colors
  [Ishikawa et al.: Fig. 11, numeral 307; Fig. 13, numerals 332-334; Fig. 14; Col. 13, lines 36-42, 55-61; Col. 14, lines 7-32. Note that the specific number of representative colors is two, one per section]
- when the number of sections is less than the specific number, setting the sections as the small region
  [Allebach et al.: Col. 5, lines 9-12. Note that each cell in the reference corresponds to a region and that repeated partitioning is equivalent to setting the sections as small regions (because then the "new" small regions can be further divided into sections)]

Ishikawa et al., Allebach et al. and Suzuki et al. are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine Suzuki et al. with the teaching of Ishikawa et al. and Allebach et al. by allowing switching between modes and repeatedly partitioning until the desired number of colors (corresponding to the number of sections here, since each section has a representative color) is achieved. The motivation would have been to be able to apply region-specific processing (since the characteristics of a, say, monochromic region and a color region will be very different) as well as to be able to fully utilize the capability of, say, the output device such as a display by using its entire color palette.

Therefore, it would have been obvious to combine Ishikawa et al. and Allebach et al. with Suzuki et al. to obtain the invention as specified in Claim 14.

***

21.   Claim 15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Suzuki et al. (US 6,118,552), Ishikawa et al. (US 5,926,292) and Allebach et al. (US

5,544,284) as applied to claim 14, further in view of Makita (US 6,269,186).

22.   Regarding claim 15, and similarly claim 30, Suzuki et al., Ishikawa et al. and

Allebach et al. disclose everything except the following, which Makita teaches:

- ```
the reference value is an average
[Abstract. Fig. 1, numeral 104; Fig. 2, numeral S202]
```

Makita, Suzuki et al., Ishikawa et al. and Allebach et al. are combinable because they

have aspects that are from the same field of endeavor of compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to combine Suzuki et al., Ishikawa et al. and Allebach et al. with the teaching of Makita

by using the average color value as the threshold (i.e., the reference). The motivation

would have been that the average is the byproduct of computing the variance and

therefore requires no additional computing time.

Therefore, it would have been obvious to combine Makita with Suzuki et al., Ishikawa et

al. and Allebach et al. to obtain the invention as specified in claim 15.

*Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
April 4, 2004

TIMOTHY M. JOHNSON
PRIMARY EXAMINER